6) Issue Investigation, Reflection, and Action Projects

Overview

This unit provides a framework for teachers to guide students conducting issue investigations in their schoolyard or community.

Students will conduct authentic investigations of chosen issues relevant to their schoolyard/community, and form action plans to remedy identified environmental problems.

Unit Table of Contents

The activities in this unit are designed to be used for explanation, elaboration and evaluation for this curriculum, as desired by the teacher. The table below lists the activities and documents in this unit, gives a brief description of the main ideas covered by each, and describes the setting for the activity.

6.1 Environmental News

A Fun Assessment Tool

Overview

This activity provides an opportunity for students to coordinate and summarize the research they have conducted during their field investigations and creatively report this knowledge by developing a newspaper. Students can include pictures; advertisements and articles that they write; captions; and headlines.

Lesson Planner

Use the table below for lesson planning purposes.

Time Required	1-2 hours
Key Concepts/Terms	Creative Writing; Synthesis; Reporting;
Prerequisites	Must have completed an issue investigation
Setting	Indoors at a desk/table; Small Group

Learning Objectives

After completing this activity, students will be able to…

- Recognize environmental issues that may affect their neighborhood/community;
- Compare data and identify trends to create solutions to environmental problems; and
- Interpret and communicate findings in a form suited to the purpose and audience using developmentally appropriate methods.

Materials Required

The following materials are required for this activity:

- Student journal entries from previous issue investigations
- Newspapers (1 section per student pair)
- Newsprint sheets (blank)
- Markers
- *Optional:* Pictures of students working on various activities during their issue investigations

Procedure

Follow the steps in the table below to conduct the activity. **Sentences in bold are suggestions for what teachers might say to students.** *Items in italics are possible student answers to questions.*

Phase	Step	Action
Engage	1	Have a copy of a current newspaper. **"What is your favorite section of the newspaper? Why?"**
	2	**"We are going to look for articles about the natural environment."** Distribute sections of the newspaper (one per pair of students). Allow time for students to look through the paper and point out relevant articles. They may need some help with this part, but if they think creatively, the natural environment is prevalent in a large number of articles.
	3	**"What are the different parts of every newspaper?"** *Using the actual newspaper as a guide, students should identify the following (with help from you):* • *Headlines* • *Advertisements* • *News Articles* • *Comics* • *Weather Information* • *Sports* • *Entertainment Section* • *Obituaries*
Explore	4	Assign students to small groups (4-6 students per group).

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Procedure (continued)

Phase	Step	Action
Explore	5	**"You are going to create a newspaper page related to the local environment, and the issue investigation we have done. You should focus on one environmental topic/issue.** **Your page should include at least one feature article about the environment, but may also include cartoons and advertisements related to our research or the environmental issue that is your focus.** **You may include drawings and photos** (if you, the teacher, have taken and provided them). **Your page should show me what you have learned, and include data and facts to support any opinions.** **Your first step should be to decide on an issue that is going to be the focus of your newspaper page. Then, discuss what articles/pieces you are going to include, and create rough drafts of these."**
	6	Pass out newsprint pages, markers, and any photos you have of the students doing research. You should also have some reference materials on hand for students to gather facts to support their opinions. You may need to show students how to reference any sources they use.
	7	As students are working, keep track of their progress, making sure their writing and drawings are accurate, even if they have chosen to use a humorous approach.
	8	Once the rough drafts are complete, students begin their newspaper page. Encourage them to use columns for articles, and to make it look like a real newspaper, adding headlines, captions, photos, etc.

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Procedure (continued)

Phase	Step	Action
Explain	9	Presentations Have each group present their work to the rest of the class. You may also photocopy the newspapers so that each student/group can have a copy. Facilitate a discussion of each article/feature, emphasizing what can be learned about the environment from its content.
Elaborate	10	Circulate/post the finished newspapers on a bulletin board, the school's Website, or the in the school newspaper.
	11	Establish a current environmental events corner in your classroom and encourage students to contribute information, articles, photos, etc.
	12	Have students develop advertisements for products or services that are environmentally friendly.
Evaluate	13	Performance Assessment: Student Environmental News Products. Sample evaluative criteria include: • Student accurately explains scientific concepts relevant to article/section topics; • Student provides enough scientific information; and • Topics/articles/features are relevant to the environmental issues of focus.
	14	Have students bring in newspaper articles that have an environmental focus. Facilitate a group discussion regarding the article, or copy the article and have the students answer questions about the article.

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Samples of Environmental News

The images below are samples from the Environmental News activity created by teacher participants from the 2004 Summer Science Institute.

6.2 Issue Investigation Framework

Overview

This is a framework for teachers to guide students conducting issue investigations in their schoolyard or community.

Lesson Planner

Use the table below for lesson planning purposes.

Time Required	1-2 hours for explaining framework.
Key Concepts/Terms	Observation, Investigation
Prerequisites	Mapping And Journaling Skills; Watershed Concept; Completion of Basic Activities from Units 3, 4, and/or 5.
Setting	Classroom

Learning Objectives

After completing this activity, students will be able to…

- Form investigative questions about environmental issues in their schoolyard or neighborhood;
- Observe, collect and record data using scientific techniques;
- Draw conclusions;
- Form predictions or hypotheses;
- Plan simple and well-designed procedures for action;
- Work as a cooperative team to implement the plan; and
- Analyze the results, draw conclusions, and share with others.

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Procedure

Follow the steps in the table below to conduct the activity. **Sentences in bold are suggestions for what teachers might say to students.** *Items in italics are possible student answers to questions.*

Phase	Step	Action
Engage	1	Identify an Environmental Concern • Guide students as they explore their school grounds or other area within their community. • Identify an area of environmental concern. • Begin *Field Journaling*. Sample Questions to Help Students I.D. Areas of Concern • **Is there a problem of trash and litter in the school yard?** • **Does the school conserve resources, recycle materials, and dispose of wastes wisely?** • **Is there erosion near the parking areas, play equipment, or near the school building roof overhangs?** • **Is there an area that could be enhanced as a habitat?**
Explore	2	Form Investigative Questions Examples: • **Where does the trash come from? What is the procedure for trash disposal?** • **Where does rainwater from the asphalt surfaces go? Are the surfaces of the schoolyard permeable or impervious?** • **What plants and animals live here? Are they native?**

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Procedure (continued)

Phase	Step	Action
Explore	3	<u>Observe, Collect And Record Data Using Scientific Techniques</u> Examples: • Collect and weigh one day's trash from the entire school. • Measure soil permeability and make a permeability map of the schoolyard. • Observe runoff during a rainstorm and measure water flow into a storm drain. • Identify and observe organisms.
	4	<u>Map the Area</u> Create a map of the schoolyard, using a base map drawn to scale and transparent overlays with each type of information collected.
Explain	5	<u>Analyze Data And Draw Conclusions</u> Examples: • Most of the trash collected comes from the lunchroom, and consists of 20% recyclable materials. • Rainwater soaks into the edges of the grassy areas better than the playing fields, and not at all on the paved. • There are several native trees, but also room for shrubs that would attract wildlife.
	6	<u>Form Predictions Or Hypotheses</u> Examples: • A recycling program in the lunchroom would result in 20% less trash by volume. • Planting a row of shrubs at the edge of the playing field would slow the flow of water into the storm drain by 30%. • Planting native shrubs would attract new species of birds.

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Procedure (continued)

Phase	Step	Action
Explore	7	<u>Conduct Research To Find Solutions</u> Examples: • Find out what can be recycled in your area, what permission students need to organize a program, and how much work is involved. • Research options to control runoff, such as a rain garden. • Research choices of native shrubs, how much maintenance they require, where to obtain them, how to plant them, and how to fund the project.
	8	<u>Develop and Implement an Action Plan</u> Examples: • Organize a recycling plan to collect and properly recycle all beverage containers from the lunchroom. • Create a rain garden to catch runoff from roof gutters. • Plant 10 native shrubs along the edge of the playing field, and set up a maintenance plan.
Elaborate	9	Share results of the investigation and action project.
Evaluate	10	• Develop a rubric for task completion, methods, results and teamwork during the exploration and research phases. • Performance evaluation on composite maps, action project.

References

Bardwell, L., Monroe, M, and M. Tudor. <u>Environmental problem solving: Theory, practice and possibilities in environmental education</u>. Troy, OH: North American Association for Environmental Education, 1994.

6.3 Circle of Concern

A Role-Playing Activity to Investigate Environmental Issues

Overview

During this activity, students will choose an environmental issue and role play to investigate the various roles present in most community decision making processes.

Lesson Planner

Use the table below for lesson planning purposes.

Time Required	45 minutes
Key Concepts/Terms	Depends on scenario chosen
Prerequisites	Watersheds, Understanding of Basic Scientific Concepts from Units 3, 4, and/or 5.
Setting	Indoors, Whole Class

Learning Objectives

After completing this activity, students will be able to…

- Demonstrate understanding of scientific concepts underlying environmental concerns; and
- Explain how land use decisions affect various people in a community.

Materials Required

No materials are required to complete this activity.

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Procedure

Follow the steps in the table below to conduct the activity. **Sentences in bold are suggestions for what teachers should say to students.** *Items in italics are possible student answers to questions.*

Phase	Step	Action
Engage	1	Choose A Scenario Find or create a scenario that is current, local, and familiar to students. Some possible examples: • Snakehead fish found in school pond • Developer buys property next to the school and wants to build: – a giant shopping mall, – a water theme park, – a tall office building, or – an airport.
	2	Choose A Forum Where The Discussion/Debate Will Take Place. For example, this could be: • County zoning board, • Community meeting, • School board meeting, or • Court room.
	3	Choose One Or More Students To Preside, As Chairmen, Judges, Or Commissioners.

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Procedure (continued)

Phase	Step	Action
Explore	4	Identify All Concerned Parties. With students, consider: • Landowners • Land users, such as joggers or dog walkers • Businesses nearby • Neighbors • Taxpayers • Community groups, such as: Scouts, Homeowners Associations, civic groups • Government agencies • Police, firefighters, park rangers
	5	Assign or ask for volunteers to represent each concerned party.
	6	Set Rules For The Discussion/Debate For example, three minutes for each party to present its case, followed by two minutes for rebuttal or questions.
	7	Give Students 10-15 Minutes To Prepare Their Case
Explain	8	Debate
	9	Allow 5 minutes for those presiding to decide, make a ruling, and explain their decision.
Evaluate	10	Performance Assessment: Develop a rubric for the student debate performance

Action Project Ideas & Resources

Overview

This section is designed to provide ideas and resource information to help students take action.

Waste Management

- Coordinate and participate in a local clean-up project. www.PotomacCleanup.org
- Create a Vermiculture/Compost Bin to reduce school trash.
- Start a school recycling program.

Runoff & Erosion

Water Quality Monitoring: *There are many established programs that assist groups in monitoring the quality of water in nearby streams. The Isaac Walton League offers information for monitoring and restoring stream habitats:* www.iwla.org

- **Rain Gardens** – www.raingardennetwork.com/
- **Storm Drain Stenciling** – http://dnr2.maryland.gov/education/Documents/StormDrainStencilForm.pdf

Ecosystem Diversity

Schoolyard Habitats

- **U.S. Fish and Wildlife Service: Schoolyard Habitat Project Guide**, *1999. Chesapeake Bay Field Office, Annapolis, MD.* (Included in your TI Flash Drive) www.fws.gov/chesapeakebay/schoolyd.htm
- **Project WILD: Wild School Sites: A Guide to Preparing for Habitat Improvement Projects on School Grounds.** *1993, by the Western Regional Environmental Education Council, Inc. Houston, TX.* www.projectwild.org/
- **National Wildlife Federation: Schoolyard Habitats: A How-to Guide for K-12 School Communities**, 2001. Vienna, VA. (They also have a supporting video). www.nwf.org

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Ecosystem Diversity (continued)

Wildlife Monitoring Projects:

- **Monarch Watch** *is a collaborative network of students, teachers, volunteers and researchers dedicated to the study of the Monarch butterfly, Danaus plexippus. For information contact:* www.monarchwatch.org

- **Classroom FeederWatch**: *Classroom FeederWatch is an exciting research and interdisciplinary education curriculum designed for students in grades 5-8.* *www.birds.cornell.edu/pfw/Members/EduHomeSchoolResources.htm*

Alien Invasive Plants:

- The Maryland Department of Natural Resources: **Be Part Of Something Big!** This guide is designed for Grades 3-8 and provides educators and students the opportunity to gain hands-on experiences with water quality monitoring. This series of activities is designed to help your class or student group learn more about the Chesapeake Bay and its tributaries. http://dnr2.maryland.gov/ccs/Pages/big.aspx

- **The Maryland Native Plant Society**: www.mdflora.org/

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Miscellaneous

- **The River of Words Project**
  An international environmental poetry and art contest designed to nurture respect and understanding of the natural world by encouraging children to learn their "ecological address" and to describe through poetry and art their own "place in space." www.riverofwords.org/

- **Maryland Association for Environmental and Outdoor Education**
  The Maryland Association for Environmental and Outdoor Education is a non-profit organization whose mission is to encourage, train, and support Maryland educators to build a citizenry that understands and is responsibly engaged in promoting sustainability, addressing human needs and conserving the Earth's natural resources. www.maeoe.org

- **Maryland Governor's Green Schools**
  The Governor's Green Schools Award Program recognizes Maryland schools that include environmental education in the curricula, model best management practices at the school, and address community environmental issues. http://maeoe.org/green-schools-green-centers/